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Soil Conservation

APRIL 1965
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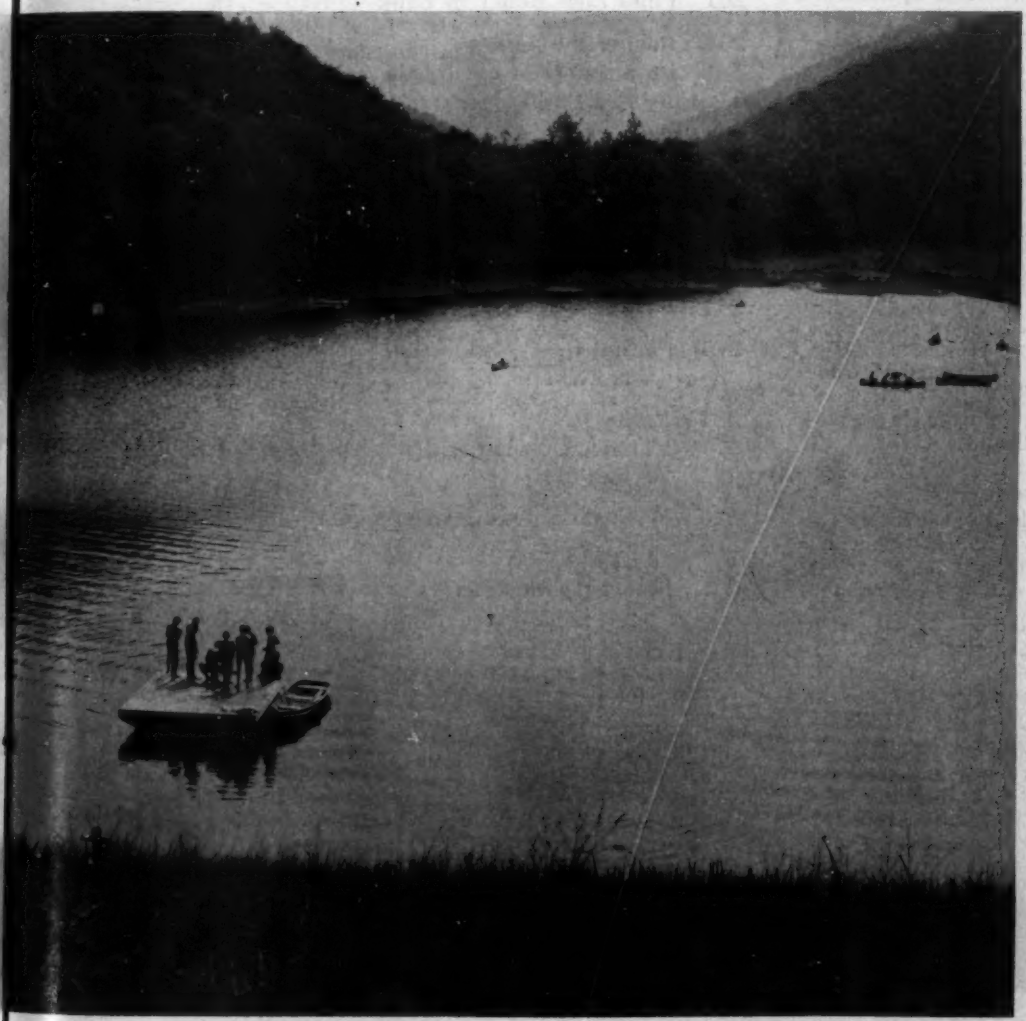
TECHNOLOGY & SCIENCE

SMALL WATERSHED PROJECTS

Land Use Adjustment and Land Treatment—Page 195
Recreation—Page 198 *Economic Development—Page 199*
Local Participation—Pages 207, 209



SOIL CONSERVATION SERVICE • U. S. DEPARTMENT OF AGRICULTURE

APRIL 19
VOL. XXX, NO.

Soil Conservation

Unanimous . . .

This issue of *Soil Conservation* should erase any doubt that land treatment, rather than structures, are the foundation of watershed protection. The President (p. 213) asks for enhancement of the beauty of the American landscape; the Secretary of Agriculture (p. 213) points out that USDA conservation efforts (like watershed projects) apply to the 85 percent of the landscape controlled by private land owners and operators; the Administrator (p. 215) restates SCS policy aiming at full treatment of watershed lands; and the Director of Watershed Planning (p. 195) spells out the benefits of conservation measures in adjusting land use and reducing runoff and erosion damages.

The message is plain: Get conservation on *all* the land as fast as possible.

Economics: Besides bringing stability and beauty to the uplands and safety to the valleys, small watershed projects bring new economic life to rural communities. SCS Engineer Samuel Cole provides an example in the story of the Roanoke Creek project, Va. (p. 199).

Cover: The community recreation potentials of small watershed projects are illustrated by Boy Scouts using a lake in the South River subwatershed of the Potomac.

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Watershed Land Treatment

Land use changes, conservation practices reduce cropland and protect reservoirs

THE success of any small watershed project depends on land treatment and land use adjustments.

These measures are the first to be considered in developing a watershed plan. In effect, they form the foundation of the watershed project, for it is on the uplands that the watershed problems originate.

Too often enthusiastic supporters think of a watershed project as a group of structures spread out across the landscape. These small dams have an extremely important function in the overall project, but their effectiveness depends largely on the quality of upland conservation measures and land use conversions undertaken by the land owners and operators.

By John H. Wetzel
Director, Watershed Planning Division, SCS, Washington, D. C.

The traveler can tell when he is in a completed watershed project by the conservation practices covering most of the land surface. The structures (lower right) may be inconspicuous and hold little water between rains.

These practices and adjustments must be tailored to fit the needs of each specific watershed. They vary widely depending on such factors as topography, climate, soils, and the desires and objectives of the project sponsors.

Land use conversions and treatment measures are absolutely essential on watershed lands. Why? Because they reduce the cost of and protect any structures that are to be built, shift cultivated crops from sloping uplands to protected flood plains, increase acreage of grass and trees, reduce quantity of runoff, curb erosion, and lessen sediment damage.

Cropland Reduced

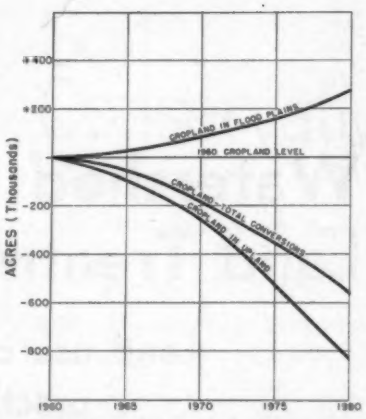
Experience has demonstrated that land use conversions tailored to meet the needs of watershed projects not only fill the soil and water conservation objectives but also result in a decrease in the amount of land in cultivated crops.

In the first 540 watershed work plans approved under Public Law 566 cropland was reduced by 168,800 acres while pasture and range land was increased by 753,300 acres.

In the six older PL-566 projects in Tennessee, cropland has been reduced by 16 percent since project installation began. Land actually planted to corn has declined 56 percent. Improved pasture has increased 43 percent and woodlands nearly 15 percent.

The Economic Research Service analysis of land use adjustments that have occurred in Arkansas' Six Mile Creek Watershed Project during the past 10 years shows that cropland has been reduced from 30,061 acres before the project to 5,970 acres in 1963—an 80 percent reduction. There has been a 61 percent increase in the grassland acreage in the watershed.

In eight representative watershed projects in Texas that cover approximately 1.75 million acres, total cropland has already been reduced from 556,000 acres before the project to 480,000 acres at the present time—a reduction of 14 percent. Acreage in cotton was reduced 55 percent and acreage in corn went down 75 percent. During the same period, forage crops were increased from 58,000 to nearly 97,000 acres, an increase of 68 percent.



Estimated cropland conversions in watershed projects, 1960-80. These projections are based on conversion rates found by the Economic Research Service in a study of 540 approved projects applied to SCS estimates of number of projects in future years.

But land use shifts are only part of the story.

The two principal factors considered in designing a watershed dam are the quantity of runoff expected under varying conditions and the amount of sediment that will be deposited in the reservoir.

And Sediment Too

Land treatment measures substantially reduce sediment deposition and slow down the volume of runoff, thereby reducing the structure's cost and prolonging its life.

Sediment production rates for different soil and slope combinations under various types of treatment can be determined with reasonable accuracy. These rates provide design data for determining the amount of sediment that will be deposited over the life expectancy of the dam.

Sufficient storage must be included in the structure for the anticipated sediment accumulation or the life of the structure will be seriously impaired.

Obviously the lower the sediment production rate, the smaller the space that must be "wasted" in each structure. Land treatment measures on the watershed acreage are the only way to decrease or control sediment production rates.

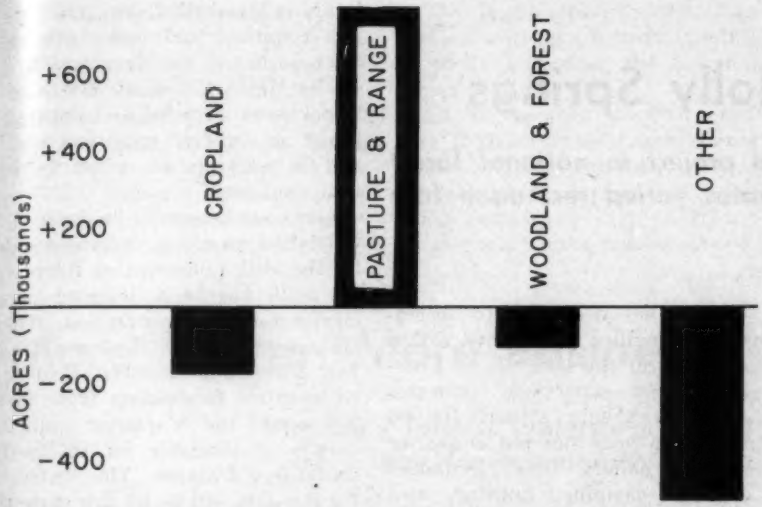
In addition to robbing capacity in reservoirs, sediment also is one of the major causes of pollution in our streams. Millions of dollars are spent each year in the Nation to remove sediment from municipal and industrial water supplies.

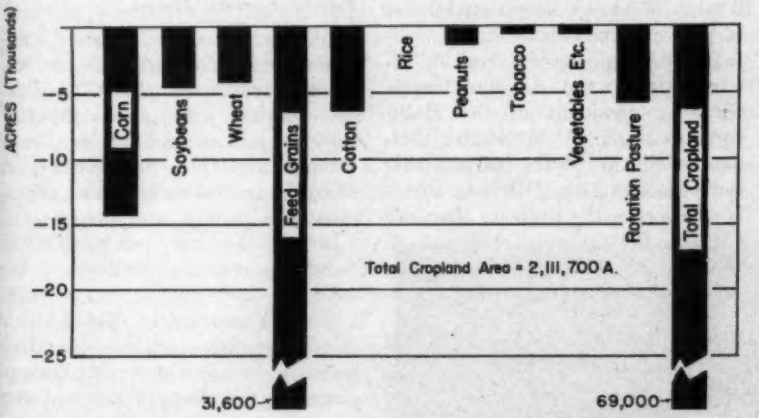
Documentation of the effectiveness of land treatment in controlling sediment production is voluminous. A recent survey on the Loch Raven Reservoir, a water supply source for Baltimore, Md., showed that the annual rate of sediment accumulation per square mile of drainage before 1943 was 0.618 acre-foot. With the installation and maintenance of a comprehensive land treatment program, this annual rate was reduced to 0.187 acre-foot for the period 1943-61—almost a 70 percent reduction.

Effect on Runoff

Land treatment practices also reduce the rate of runoff, but their effectiveness varies a great deal with the moisture content of the soil at the time the rain falls and the condition of the soil—whether frozen, compacted, freshly plowed, or what. Therefore, the watershed structures must be designed to meet the more unfavorable conditions anticipated in the watershed.

Although all land treatment measures in watershed projects are designed primarily for soil and water conservation, the additional benefits to both the community and the landowner are numerous. The sweeping curves of stripcropping and terraces, the lush green of rich pastures and growing trees all fit into our Nation's effort to beautify rural America.





ABOVE: Estimated changes in land use in 540 approved small watershed projects. BELOW: Planned changes in use of cropland in 112 small watershed project work plans completed since September 15, 1963.

Vegetative measures necessary in meeting the objectives of the watershed project are almost as important in improving wildlife habitat.

When land treatment measures are carefully planned and coordinated with the fish and wildlife provisions under Public Law 566, the combination can greatly improve conditions for wildlife. The same opportunity exists for coordinating income-producing recreation land treatment measures with a public recreation development installed as a part of the watershed project.

Landowners' Contribution

Under the cost-sharing arrangements in watershed projects, landowners are expected to install the most needed land treatment measures at their own expense, except for the financial assistance available under the Agricultural Conservation Program. This is the landowners' contribution to the project. It is substantial and extremely important. Structural measures cannot be fully effective unless these soil and water conservation measures are applied on the individual farms and ranches.

For this reason one-half of the land above floodwater-retarding dams must be under basic conservation plans before the structures will be built. On seriously erosion-prone areas, 75 percent of the measures must be installed before construction begins.

Since the foundation of any watershed project is in the hands of the local land owners and operators, they alone can make it a success. The local sponsoring organizations and urban residents, when involved, should recognize the substantial contribution the watershed landowners are making and give them full credit. ♦

A Pond Is a Place Of Many Delights

DUFFIN'S pond in Vermilion County, Ill., is a delight to many people for many reasons.

The owners, Russ and Jack Duffin, enjoy it as an outdoor laboratory for nature study in addition to its main purpose as a source of water for their livestock.

Mrs. Duffin conducts her merit badge counselor work with Girl Scouts in the area.

Local school teachers, Audubon Society members, scouts, and school children are attracted to the place by the many species of trees, birds, insects, and plants in the area. In addition to an adjacent picnic area, the pond provides excellent fishing and swimming in the summer.

The Duffins are cooperators of the Vermilion County Soil and Water Conservation District, which has used the pond as a conservation demonstration area for school teachers.

The pond was designed and its construction was supervised by the Soil Conservation Service. Seaside creeping bent grass was seeded on the pond margins.—GEORGE KINDER, *Soil Conservationist, SCS, Danville, Ill.* ♦

Teamwork at Holly Springs

Watershed project in national forest creates varied recreation fare

By W. L. Heard
State Conservationist, SCS, Jackson, Miss.

THOUSANDS of Mississippians enjoy boating, fishing, and other water-based sports in the numerous small watershed projects in the State.

Thousands of Mississippians also enjoy camping, picnicking, and hunting in national forests.

Now these two primary attractions of outdoor recreation—water and trees—are teaming up in the Holly Springs National Forest.

Multipurpose Reservoir

Chewalla Lake is the first reservoir in the Southeastern United States to be developed for multiple purposes on national forest land, according to the Forest Service.

This 259-acre lake will be 8 miles east of Holly Springs, in a 984-acre tract which the Forest Service has dedicated to recreation. A million people live within 50 miles of the lake. J. C. Franson, forest supervisor, estimates the area should attract 100,000 visitors a year and put a quarter million dollars into circulation through camping, hunting, and other activities.

Congressman Jamie Whitten, touring the site recently, said the "value of these recreational lakes is just unbelievable."

Local people have taken an active part in the project. Harris Gholson, president of the Holly Springs Bank; A. T. Gunter, Belden, chairman of the Tallahatchie Soil Conservation District, which is sponsoring the project; Marshall Clifton, Potts Camp, chairman of the Tippah River Drainage District; members of the State Legislature in Marshall, Union, and Tippah counties; and many others have promoted the development.

The Marshall County Board of Supervisors acquired and donated about 88 acres of adjoining land and is working on access roads into the area.

Like most reservoirs in the small watershed program, administered by the Soil Conservation Service, Chewalla has been designed primarily for flood prevention. The lake, a structure in the lower Tippah River Subwatershed Project, will control floodwaters from 18,500 acres, and a quarter million dollars is available for its flood prevention features. The contract for the dam will be let this spring, and work should be completed in two construction seasons.

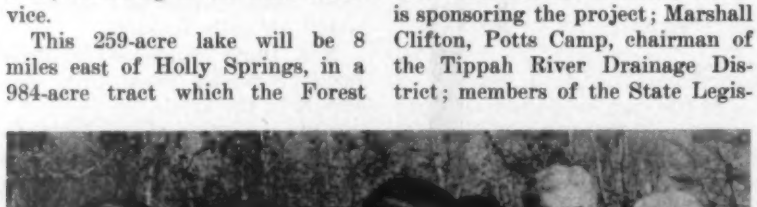
Forest Service Helps

SCS engineers designed the structure and helped with the watershed treatment plan. The Forest Service will spend about a quarter million dollars, as funds become available, in construction of roads, sanitation facilities, campsites, boat ramps, and the like. In addition, they have put up $50,000 to add recreational facilities to the lake.

The Yazoo-Little Tallahatchie flood prevention project extending across 19 northern Mississippi counties, has changed much of this country from raw gullies to green pastures, lakes, and towering trees.

The Holly Springs National Forest is no exception. Here some 200,000 pine trees, planted over the years as part of the erosion control measures in the project, add to the beauty and productive capacity of the forest.

Large dogwoods add extra color to these woods in the spring and giant cypress trees soak their feet in the swamp. Deer, drawn to forage and shelter, have concentrated here in one of the highest populations in the State. The Mississippi Game and Fish Commission, which manages hunting and fishing in



Recreation plan for Holly Springs is reviewed at the site by (l. to r.) J. C. Totten, Marshall County Board of Supervisors; A. T. Gunter, chairman, Tallahatchie River SCD; J. E. Franscon, Forest Service; Congressman Jamie Whitten; the author; and Harris Gholson, president, Holly Springs Bank.

the area, annually records a high kill.

The Forest Service will continue to manage wildlife habitat for maximum populations of deer, turkey, and quail. An ancient Indian mound on the west side of the lake will be a featured attraction. Here the Forest Service plans an information center for tourists.

The Mississippi Forestry Commission will assist with fire control in areas adjoining the national forest.

All the agencies involved—and just about everybody in the area—are working together on this recreational development, to bring pleasure and profit to Holly Springs and nearby communities. ♦

More Water, More Business

Virginia's largest watershed project paves way for community growth

KEYSVILLE, Va., is literally "priming its pumps" to start a wave of prosperity rolling across the community. The pumps, part of a new $315,000 municipal water supply system, can deliver up to a million gallons daily to Keysville. Thus ends a water shortage that restricted expansion in recent years.

The water source, a new 45-acre reservoir, was formed by one of 17 floodwater dams being built as part of the 141,900-acre Roanoke Creek Watershed Project. Two other reservoirs will provide added multiple-use benefits to watershed residents in this largest Public Law 566 project under construction in Virginia.

Immediate Benefit

"Our new water supply has one immediate benefit," says Keysville Mayor Howard H. Harmer, Jr. "The local textile plant, Crown Colony Chenille Company, has stepped up production by 25 percent. This means more jobs for our town. Other industries, attracted by our new water resource, are considering Keysville as the likely site for their new plants."

Keysville has been getting by on an average of 200,000 gallons of water a day. The textile plant, opened 16 years ago, had expanded to a 250-job, three-shift operation with water demands growing each year. But, reaching the limit of water supplies, operations had been restricted.

"Two years ago we had to close shop 2 days a week for 6 weeks to conserve water in a prolonged dry spell," recalls J. Creighton Riepe, Jr., treasurer of the firm.

Now, with the lid off water limitations, the plant managers are planning further expansion as business grows.

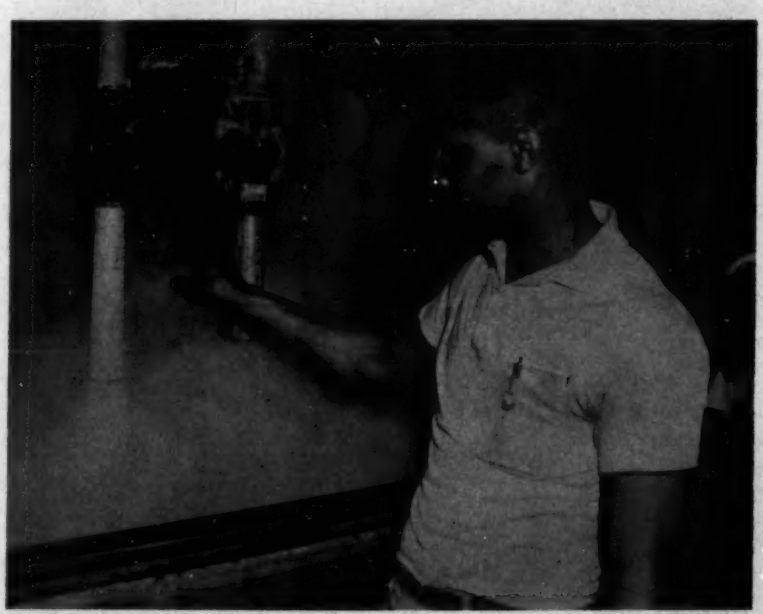
Two powerful electric pumps now supplement a series of old wells in Keysville. They siphon 700 gallons of water a minute from the reservoirs, sending it 6,000 feet to a new filtering plant on the edge of town. From there the water flows into the older system and on to the 600,000-gallon storage tank.

Costs of installing the new water system and enlarging the dam to provide municipal water were financed by a local bond issue.

The reservoir and surrounding land are being maintained by Keysville, with steps to improve the area already underway. More than 50 acres of open land has been protected by loblolly pines. A large town recreation area at the lake is the ultimate goal.

How It Started

The break in Keysville's water shortage came with a proposal for a watershed project by the Southside Soil Conservation District. William F. Vaughan, chairman of



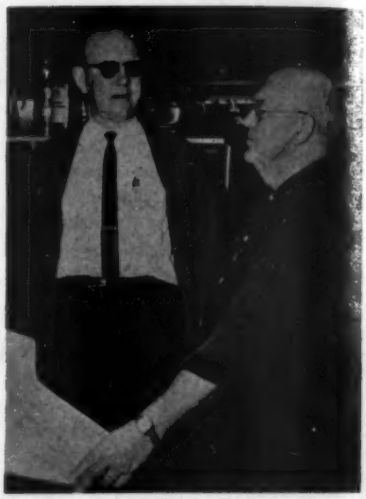
Harry Hartso uses tons of water every day in his dye-process job at the chenille plant in Keysville. The plant uses 130,000 gallons a day.

the district and lifetime Keysville farmer, was acquainted with the water problem from both the town and rural angles.

"While Keysville and nearby Drake's Branch were short on water, we farmers were being flooded out of our valuable bottomland acres," Mr. Vaughan said. "We needed to store our water upstream to prevent floods and give the towns the water they required."

Roanoke Creek's dual water problem was well suited for cost-sharing aid offered under the small watershed program. With local sponsorship from the conservation district and from Charlotte County, Keysville, and Drake's Branch, the project took shape on the land. SCS specialists provided the necessary technical planning assistance, and Public Law 566 funds covered structural improvement costs. Local folks handled easements, contracting, and the all-important upland conservation measures.

Roanoke Creek's flood problem centered around 6,000 acres of rich bottomland, explains SCS Civil Engineer Samuel D. Cole, Jr. Pre-Civil War plantation owners had made good use of these fields with slave labor to dig and maintain drainage ditches and stream channels.



Drake's Branch Mayor John S. Locke (l.) and ex-mayor W. T. Blanks, councilman, discuss long-range plans for making use of the town's new water supply created by the reservoir.

Fifty-four miles of channel improvement work in the project holds runoff from a heavy rain safely within the creek banks. Settling basins at the Keysville plant process water drawn from the reservoirs.

But post-war labor shortages and erosion from the uplands changed this. Over the years both ditches and channels filled, sending high water over valuable crops. Farmers gradually moved to higher ground.

This led to other complications. Upland soils were prone to serious erosion when plowed. Gullies gouged the rolling hills, dumping added tons of topsoil in already clogged tributaries of Roanoke Creek. Farms deteriorated and their owners moved on, leaving their idle acres to add to the growing siltation problem.

Drake's Branch, known then as "the world's largest dark-tobacco market," was the one town in the watershed located in the flood plain. The rampaging Twittys Creek, a Roanoke Creek tributary, overran the town more often with each passing year, leaving heavy damages and deep deposits of mud in the business center. One flood,

in 1940, did $30,000 in damage. It sent several businesses looking for safer communities. The town was saved from complete economic disaster when Burlington Worcester Mills built a new plant on high ground near town, where 650 people are now employed.

"We had the water problem from both ends," says John S. Locke, mayor of Drake's Branch. "The flood problem was compounded by a water shortage during summer dry spells. We've had to ration water four or five times in recent years. But both problems will end as soon as our new dam is built on Twittys Creek just above town."

Mr. Locke refers to the second of the two watershed dams to serve the dual municipal water-flood prevention use. Because of ideal land formations their reservoir will cover 90 acres and provide an almost unlimited supply of water to Drake's Branch. At a cost of $25,000, the town will have water for any possible expansion and an ideal recreation area for future development.

Project Half Done

Today, the Roanoke Creek project is about 50 percent completed, Engineer Cole reports. Twenty miles of once-debris-filled channels, part of the 54 miles scheduled for improvement, have been reopened. The Virginia State Highway Department is vegetating 95 miles of eroding roadbanks to end that source of siltation. One reservoir, the third multipurpose structure in the project, provides irrigation water to the farm owner.

Ten of the planned 17 flood-retarding dams are now in place. The remaining 7 will take shape in the next few years. Together, they will be capable of blocking up to 6 billion gallons of potential floodwater to reduce flooding to a safe minimum.

In upland areas, landowners continue to add conservation measures to their fields and forests in an all-out effort to control erosion. Accelerating the work SCS and the Virginia Division of Forestry have provided added technical aid with the cost-sharing assistance of the Agricultural Stabilization and Conservation Service. Stripcropping; woodland management; pasture and grassland development; and pond, diversion, and terrace construction are healing old gullies, preventing erosion, and improving farms in the watershed.

The project, covering more than half of Charlotte County, will cost $2,306,335; watershed funds will cover $1,528,532 of the total. SCS economists predict a return of $1.40 for each dollar invested.

Already reaping benefits from the project, the 8,000 Roanoke Creek watershed residents will gain even more in the next few years. With adequate water for future expansion, Keysville and Drake's Branch have a bright future. New industry and population gains will pump added dollars into the local economy. Farmers will have betters farms and improved markets. Recreation enterprises, summer cottages, and year-round homes can be developed next to the new reservoirs.

Surrounding communities in and near the project will soon feel beneficial side effects as Roanoke Creek's new water resource pumps prosperity into the area. ♦

Pines Like Money in Bank For Banker-Farmer

"MY PINES are like money in the bank."

This is a banker, farmer, and conservationist speaking. He is S. B. Huff of Greenville County, S.C. He helped organize the Farmers Bank of Simpsonville in 1914 and the Greenville County Soil Conservation District in 1940. He has served as a member of the board of directors of both institutions ever since.

Pines have played an important part in the progress of the 300-acre Huff farm in the Fork Shoals Road Community since 1929 when one of Huff's sons came home from a high school vocational agriculture class and said he could get 1,000 loblolly pine seedlings from a State nursery if he had a place to set them out.

"I didn't think much of the idea at first," Huff said, "I'd been used to scrub pines and I didn't think loblollies would grow — but we planted those seedlings. I realize now I made a good decision."

He's been planting loblolly and slash at the ratio of about two-thirds loblolly and one-third slash. Pines now cover about one-half of his farm. By using the woodland management practices recommended by the South Carolina State Forestry Commission and the Soil Conservation Service, Huff says he has been able to get a cash income from his crop of trees and yet maintain a good stand of timber for future use.

Drawing Dividends

"It's like drawing dividends and keeping your principal intact," he said.

Recently Huff had 30 acres of pines marked and thinned out. He got more than 120,000 board feet of saw timber that brought $35 a thousand on the stump from that tract.

SCS Conservationist H. Granade, Greenville County, helped Huff prepare a conservation farm plan in 1936 and revise it twice since then. Huff said knowledge of the soils on his farm and their capabilities has made it possible to get the best use from each acre.

At one time he planted 80 acres of cotton plus corn and other row crops. Six tenant families lived on the place. Now he has only 8 acres of cotton planted by the one remaining tenant. As many other farmers in the South, Huff realized the value of switching from row crops to timber, grass, and cattle. Some 50 to 60 head of white-faced Herefords graze fescue grass in improved pastures and dallisgrass in the bottoms.

A Watershed Project

Granade said Huff was the driving force behind the Huff Creek Watershed Project. The project, covering 21,000 acres, was put into operation in 1960. Three dams have been completed and two remaining dams are contracted to be built in 1965. One of these will be on the Huff farm and will protect some of his bottom land from flooding.

Although 82 years old, Huff sets a fast pace. He operates a tractor, rides a horse, or walks across pastures and through woods. Often he dashes off in his car or pickup truck to attend a bank directors' meeting or sessions of the soil conservation district as a supervisor, the Blue Ridge Production Credit Association as vice president, or the Huff Creek Watershed District.

Huff was the 23d farmer in South Carolina to be recognized as a "tree farmer" by the American Forest Products Industries. For many years he served on a committee to help select other "tree farmers" in the State. He's proud of the forest fire prevention work that's been done in the county.

Fire Control

"Our county was one of the first in the State to pass a law that required a landowner to get a permit from a forest ranger before burning," he said. "We've had a fire tower for 30 years."

Mr. and Mrs. Huff live in a house built by his great grandfather, John Moon Cureton, in 1820 when the farm was part of a big plantation.

Thirty-year-old pines provide S. B. Huff with a good cash income.

"Sherman's army camped on the plantation during the Civil War, and some of his soldiers stood on the portico and shot chickens off the roof of the smokehouse," Huff said.

Both of the Huff sons are graduates of Clemson University—James Roscoe now is an SCS hydrologist in Georgia, Patrick D. an engineer with Duke Power Co. in Charlotte, N.C.

Huff believes woodland is a renewable natural resource. He has put this valuable resource to work on his farm. ♦

Never Summer Ranch Is Favorite Summering Spot

DESPITE its name, the Never Summer Ranch—located in north-central Colorado in the shadow of the majestic mountain range of the same name—has been a favorite summering spot for vacationers for nearly a half century.

The ranch offers horseback riding, hiking, and trout fishing in leaping mountain streams, and some of the most spectacular mountain scenery on the continent.

Operators of the ranch over the years have been the Holzwarths—John G. II, Mrs. Holzwarth, and their son, John III.

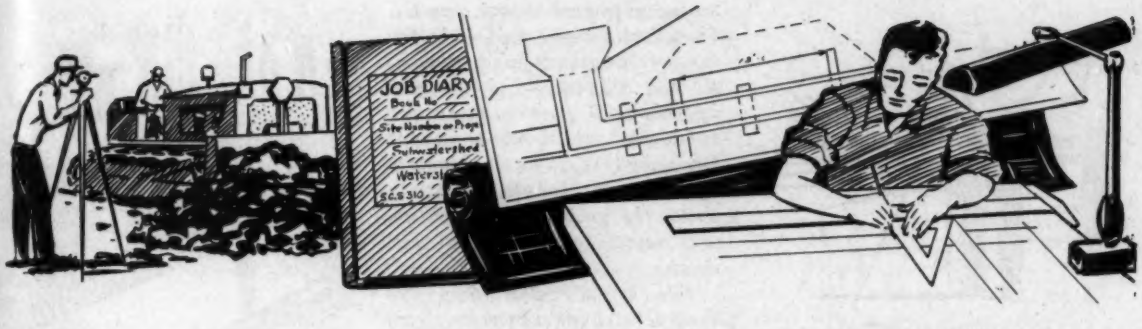
In June 1957, the Middle Park Soil Conservation District was formed and the Holzwarths became active cooperators in the district's program. John III is serving as a member of the district's board of supervisors, although when there is a meeting he must drive 100 miles round trip to Kremmling.

Until recent years the guest traffic demanded only a modest string of horses. Then, as business grew, the Holzwarths added to the number until they were carrying an average of 50 horses through the winter. They were renting 15 to 20 additional mounts for the summer riding months.

Keeping these horses meant a huge winter feed bill in addition to the cost of hay for the summer.

With the help of SCS, the Holzwarths developed a conservation plan to revise their irrigation system in the Colorado River's North Fork and provide better pasture and hay.

In addition to their guest ranch operation, the Holzwarths are developing a private campground. Thirty-five camping units are planned. Layout is so that additional units, up to 100, can be added.—ROBERT W. WOODS, *Work Unit Conservationist, SCS, Kremmling, Colo.* ♦



Behind the Scenes

On a Watershed Construction Job

By Paul E. Nylander
Construction Engineer, SCS, Washington, D.C.

As you drive along the highway and view the things man has made, do you find yourself wondering what might have gone on behind the scenes during their construction? What their purpose might be? For whom and by whom they were constructed?

One of the structures we see more of each passing year, all across the country, is the floodwater-retarding or multiple-purpose dam constructed under Public Law 566. These dams, located in the upper watersheds, are designed to store flood runoff temporarily and release it at a safe rate. They are constructed by the local people with Federal assistance provided through Soil Conservation Service.

To gain an insight into the construction of one of these projects let's leaf through the diary of the SCS construction engineer on the job and ponder some of the entries.

Millcreek Watershed Site No. 4

4/8/63. Contract awarded Bloom Construction Company.

This statement sounds simple enough. Yet before it could occur, many weeks were spent in making surveys, studying the geology, testing the soil materials, obtaining rights-of-way, making the structural designs, preparing the construction drawings and specifications, and executing contractual documents.

4/12. Mr. Bean, State administrative officer, advised by phone that he and Mr. Noble, State engineer, would meet me, Mr. Arandt, contracting officer for Banner County Commissioners, and Mr. Bloom, contractor, at the County Commissioner's office at 10 a.m., April 14, to go over the plans and specifications together; and to discuss the contract and the responsibilities of the parties involved in the construction at site No. 4.

Experience has proved the absolute necessity of teamwork. The local people desire this project and have been motivated to work with the Soil Conservation Service to prepare for it. Now a third party must be included in that team. If the work is to go well, he must join the team not only with his construction forces but also with his personal support and supervision.

4/14. The contractor submitted his prosposed schedule of work for our review and approval. He wants to begin clearing and grubbing the first of next week. I advised we would have the site rough staked by then.

Planning, scheduling, coordinating—essential elements to good construction. Were they well carried out on this job?

4/15. Rough staked the embankment and spillway areas and the borrow areas for clearing and grubbing. Will slope stake and x-section embankment and borrow areas as soon as clearing and grubbing are complete. It appears the ROW (right-of-way) obtained by the local people provides sufficient room for work area and disposal of waste as well as the structure and borrow. Access routes are clear and ample.

4/28. Baker and Grumann running sieve analysis on drain fill sample submitted by contractor for foundation drains.

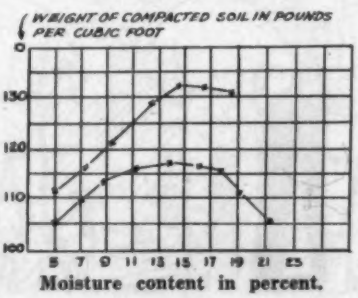
5/3. Inspected excavations as made to determine the limits necessary. Approximately ½ foot of topsoil removed from foundation and borrow areas. Lower limit of the foundation drain approximately 18 inches deeper than estimated in the design to reach the pervious material underlying the valley floor. Greater depth due to drain location being moved approximately 30 feet downstream from the drill logs used in planning. Core trench excavation essentially as planned — see cross-section. Was able to place all excavated material in upsteam toe of embankment as it was removed, so will be paid for only as embankment.

Grumann and Baker have been running Proctor curves on borrow material. We have the quantities and the characteristics as shown on the plan essentially pinned down. The CL (nonplastic clay) materials for the core as represented by sample No. 103, pit No. 3, are giving about 2 pounds more per cubic foot at about 1 percent less moisture than the laboratory sample. In all, our study shows the geologic investigation and sampling were very well done.

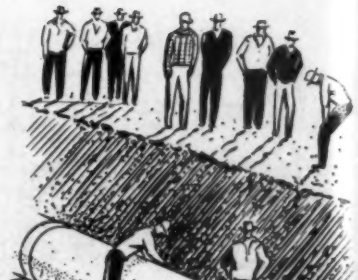
The 4-foot coffer dam the contractor built upstream from the site appears adequate to hold back the small streamflow now coming down the valley. Except for a slight seepage the core trench is dry and the accumulation can be quickly removed before backfilling.

Measuring, testing, inspecting—like preparing meals and washing dishes they tend to become a monotonous routine. Yet the quality of the structure would not be assured without them. Standard specifications have been prepared for

Soil compaction test.



Moisture content in percent.



each item of work. Certain requirements were known by the design engineer to be necessary to perform individual functions. Here they are being transferred from a concept to a reality and there must be no mistake in the process.

5/12. Advised Mr. Bloom the payment lines are the neat (exact) lines of the specified cross-section.

We knew there would be a reference to money somewhere. On second thought, in spite of taxes and troubles, this is an improvement which will add much to the safety and enjoyment of the community. There probably will be an opportunity for recreation in the form of fishing, hunting, or water sports. Perhaps there is enough additional water stored for irrigation, municipal, or industrial use. Good things aren't free nor would we value them if they were.

5/20. Concrete pipe arrived today. Mr. Arandt called to say he had received the certification that the pipe was manufactured according to the specification. Contractor placed eight lengths. Went together smoothly. Paid particular attention to joints and elevations. Had only one rubber gasket displace, so removed the section and relaid, straightening out the gasket. The steel rings go together well

when the gasket and ring are well lubricated with vegetable soap and the sections alined carefully. Contractor hopes to place concrete in the cradle, cutoffs, and pipe support late tomorrow p.m.

Materials must be selected carefully if they are to fulfill their purpose for a hundred years. Buried as they are under many hundred tons of earth they will be subjected to very great stress. To have to replace them because of deterioration or improper construction would be costly as well as interrupting the protection and purpose of the structure.

Crushing of concrete sample.

5/21. Completed placing pipe at noon. Inspected forms and steel in base of riser pipe cradle, cutoffs, and pipe support at 3 p.m. Contractor has elected to use class B concrete in the cradle also rather than to furnish two classes. Concrete began arriving at 3:30 p.m. and job completed at 5:30 p.m. Slump test

Concrete slump test.

on first load was just under 3 inches and entrained air 5½ percent. Baker made cylinders from first load and from the last. Load No. 1 was placed in upper two sections of cradle, load No. 4 in lower two sections. Exposed surfaces will be cured with covering of burlap kept wet by seep hose. Contractor had short tremie to place concrete in pipe support. This support extends approximately 10 feet below the invert of the pipe. Weather forecast is for a low of 45° F. tonight so no heat will be necessary to protect the green concrete unless lower temperatures are reached. Contractor is leaving a watchman on duty to notify him if heat is required.

I wonder if the contractor was aware of the multitude and exactness of the requirements of this job when he bid on it. Certainly he must have needed great determination to meet them all under the conditions of weather and of the site that normally exist.

5/22. Checked the maximum-minimum thermometer the first thing this morning. Low 47° last night.

5/29. Contractor expects to place concrete in riser tomorrow. Inspected reinforcing steel forms and fastenings for slide gate and gate well in p.m. One Mark 3 No. 6 bar had to be added just over the pipe in the riser. Advised contractor it would be wise to have a spare concrete vibrator to be sure that if his broke down he wouldn't have to stop placing concrete. Seven-day cylinders on cradle and diaphrams show ample strength to put in service. Backfill will be started tomorrow.

Railroads and airlines aren't the only ones that require safety features and standby equipment.

5/31. Forms stripped from riser. Slight honeycombing below port repaired. Form tie holes filled and structure coated

Pouring concrete through a tremie.

with curing compound. Observed this application, placed in two coats, different directions. Good coverage.

Contractor continued placing embankment materials. Began crossing over pipe with heavy equipment from 30 feet above the centerline of dam to downstream slope. Hand placed backfill in excess of 2.0 feet over all concrete or concrete pipe. One moisture density test of backfill satisfactory, two tests of embankment. Density Test No. 34 of zone No. 1 material 92 percent of specified density. Will run another first thing in morning for check. May have to rework the first foot.

6/1. Worked with Contracting Officer Mr. Arandt on quantities and forms 49a and 49b for monthly pay estimate.

Check test on moisture density of fill placed in zone No. 1 approximate elevation 21.7, 90.7 percent, 23.7 percent moisture. Contractor elected to rip

up the last lift and recompact. Drying obtained by reworking should bring moisture content down so that specified density will be obtained. 4 p.m., moisture density test of reworked material shows 96.7 percent standard Proctor so contractor began new lift.

H'mm! There were some problems!

6/6. Word received on 7-day break of concrete test cylinder for riser at 3,170 psi (pounds per square inch). Contractor may begin backfill around riser tomorrow.

Step by step the work progresses.

6/8. Took final x-sections of channel and scourhole excavation station 3+47 to 7+85. Contractor has finished this area very well. Material in scourhole quite cemented so would not have developed by action of water alone without considerable lateral scour.

6/22. Material in inlet of emergency spillway became extremely hard. Contractor requested rock classification station 0+50 to 1+35, approximate elevation 30.0 and 34.0 respectively. Since it is a borderline decision he will mount ripper on test tractor this p.m. in order that we can test ripability for classification of this area tomorrow. Ripper he has been using has been on larger tractor.

Decisions, decisions. There must have been many of them before this job was completed.

6/23. Material tested for ripability classified as rock. Test equipment could not remove it. Took cross-sections of surface as exposed. Will add to the survey as rock is uncovered if larger area is involved. Called State Conservation Engineer Mr. Noble to advise of classification of excavation and to discuss use of coarser material. He agrees the difference is too slight to require any change.

Consultation is the thing. Be sure there's agreement among those responsible. This teamwork seems both admirable and effective—and certainly much more pleasant.

6/24. Rain beginning about 3 a.m. Advised contractor at 8 a.m. I would ask contracting officer to issue stop order as of that time. Too wet to operate equipment or to place fill.

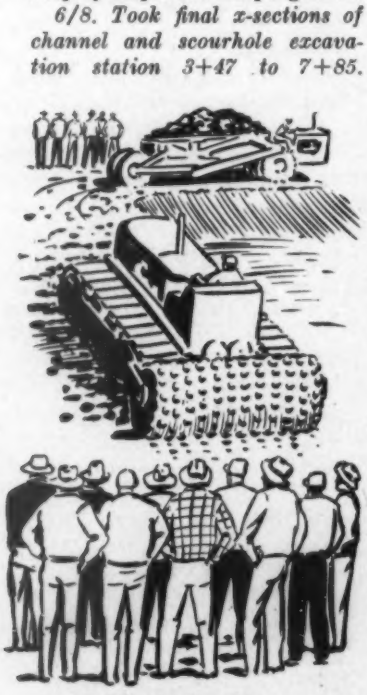
6/27. Contracting officer issued start order as of 8 a.m.

They've even made provision in the contract to stop for bad weather. This should make the contractor's costs more predictable.

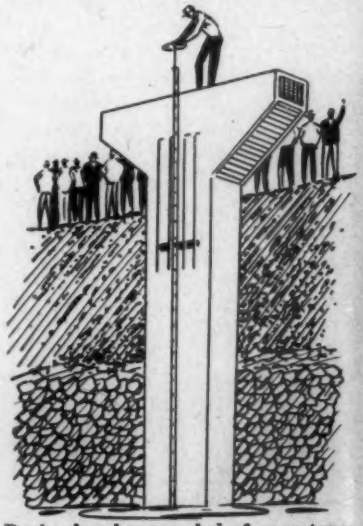
6/30. State Conservation Engineer Mr. Noble on job for semifinal inspection. Noted broken earthscraper at edge of borrow pit No. 2, also some large boulders on the edge of the woods about the same location. The latter had come from the borrow area and will have to be buried there. The scraper must be moved. Riprap along approach to emergency spillway too coarse to blend into contour of side slope. Will have to be reduced in size and shaped up. Some cleared material and a fringe of borrow stippings right side, upper end of sediment pool must be cleaned up. In general Mr. Noble believed the finish was very good.

Contractor will begin fencing tomorrow and seeding and mulching Monday. Expects to be finished with all phases Wednesday, July 12. Have notified contracting officer and State administrative officer. Expect to set up final inspection for Friday, July 14.

Well! It's good to have that job completed. Without reviewing this diary we'd have no concept of the many steps, the various items, the myriad of decisions, and the willingness to work together that were required. It couldn't have been accomplished by any one of the three parties working singly, but together they made it a work of which they can be proud. ♦



Grading and packing.



Drain closed as symbol of acceptance.

Alton Mangum (r.), SCS assistant State conservationist, discusses plans for the Bayou Rapides Watershed Project at a regular meeting of the Rapides Parish Police Jury.

In Three Louisiana Parishes . . .

Police Juries Boost Small Watershed Activity

By J. B. Earle
State Conservationist, SCS, Alexandria, La.

GOVERNING bodies of three Louisiana parishes (counties) have joined with other public and private groups to promote small watershed projects in their areas.

Voters of Rapides, Evangeline, and Tensas parishes have given the parish police juries authority to levy taxes, exercise the right of eminent domain, and contract for, operate, and maintain watershed projects.

Sound Planning

This widespread authority permits sound planning of all phases of watershed projects. The experience of the three parishes underlines the value of cooperation between local government leadership and soil conservation districts.

The people of Rapides Parish voted a 4-mill tax levy, to run for 10 years, to develop the Bayou Rapides and Bayou Boeuf watersheds. Work is underway on the Cotile Reservoir in Bayou Rapides. The reservoir will contain 25,000 acre-feet of water storage for irrigation and recreation.

Planning is nearly complete on the Bayou Boeuf Watershed Project, which will contain two similar multipurpose reservoirs on Valentine and Indian creeks. These lakes will provide irrigation water for nearly 40,000 acres of land. The increased value of this land is expected to more than repay the estimated $2.5 million that the projects will cost the parish, according to Brian Duke, president of the Rapides Parish Police Jury.

A Recreation Bonus

"And for a bonus we will have three of the finest recreation areas in the State," Duke said.

O. O. Moore (l.) of SCS explains a backfilling operation on the Cotile Reservoir of the Bayou Rapides Watershed Project to J. A. DeKeyzer of the Lower West Red River SWCD and Brian Duke of the Rapides Parish Police Jury.

In adjoining Evangeline Parish the need for a parishwide effort became evident after 14 drainage districts and 79 group drainage projects failed to solve the parish's soil and water problems.

A. G. LaHaye of Evangeline Parish, a supervisor of the Grand Coteau Ridge Soil Conservation District, told about the opportunities under USDA's watershed protection and flood prevention program. Farmers were interested.

"We were interested, too," said John Andrus, president of the Police Jury. "We have seen the first proposed small watershed project in the parish wither for lack of an effective legal organization to put it through. We were willing for the parish government to be that strong arm, but we wanted all of the parish to be served and we wanted the people to make the decision without undue influence from us."

Local Funds

Plans were laid to develop three watershed projects to serve all of the land in the parish that needed such treatment. The voters approved a $1 million bond issue to develop the parish's land and water resources and provide measures for flood prevention, and water management.

Major items of improvement planned are 17 flood detention dams, with 1 enlarged for recreation; about 275 miles of stream channel improvement; and many low-level dams in the channels to hold water for irrigation.

In Tensas Parish, local, State, and Federal cooperation has resulted in a sound conservation program. More than 100 miles of channel improvement is being completed in Gravity Drainage District No. 2, in the northern part of the parish, at a cost of about $500,000. Local funds are paying half of this cost.

Landowners in Tensas Parish are expected to spend more than $2 million for water management, land leveling, and other land treatment practices on 76,000 acres. Benefits will be an estimated $5 for every $1 of cost. Plans are being made for similar programs throughout Tensas Parish.

Land, water, and people in this part of Louisiana will benefit from the increased watershed activity made possible by the cooperation of the parish police juries. ♦

DeKeyzer and Duke, standing at the drawdown tube being constructed for the Cotile Reservoir, discuss progress being made at the site.

Great Plains Conservation Program

The Great Plains Conservation Program is a long-term soil and water conservation program aimed at bringing about needed land use adjustments and the application of enduring conservation practices.

In the Great Plains, an area of severe climatic hazards, various programs have been carried out in the past to meet emergency situations at a relatively high cost. The Great Plains Program is designed to bring about a more nearly permanent solution to the problem resulting from drought and the cultivation of low-grade cropland.

This program was recommended by the Great Plains Agricultural Council, by farm organizations, soil conservation districts, and others. Responsibility for administration is assigned to SCS. ♦

River Basin Investigations

The Soil Conservation Service cooperates with State governments and with other Federal agencies in river basin planning, surveys, and investigation, under the provisions of Watershed Protection and Flood Prevention Act, as amended.

River basin surveys are undertaken at the request of the cooperating State or Federal agencies. They are extremely valuable in maintaining coordination between the upstream watershed aspects for which USDA has responsibility and the downstream problems of water resource use and development. ♦

One cow can drink close to 25 gallons of water a day—so stockwater ponds need to be deep and capable of providing adequate water supplies.

Bluebunch wheatgrass provides abundant forage on the rolling Pilot Rock range.

Animal-Unit Leases Help Balance Grazing on Pilot Rock Range

By Edgar Baumann and Bud Lemmons
Work Unit Conservationist, SCS, and News-Director, Georgia-Pacific Corporation, Pendleton, Oreg.

The fence line between the Cunha Tract, to the right, and untreated range shows the effect of the conservation program.

A CONSERVATION plan based on per-animal range leasing has produced impressive results for the Georgia-Pacific Corporation, a major timber-lumber-plywood firm in Northwestern United States.

Working with the Southern Umatilla Soil Conservation District and the Soil Conservation Service, Georgia-Pacific has developed a conservation plan for its Pilot Rock Division in Oregon. The plan provides for seasonal inspections to determine how many cattle to pasture on a scheduled basis in designated areas, and users pay for the animal-units of grazing obtained.

Range leases formerly were made on a per-acre basis without consideration of type or amount of forage available. Range condition generally declined under that system.

Larger Calves

Ranchers note larger gains per calf during the growing season than on similar ranges under the old system. Cattle graze on abundant forage as a result of a planned conservation program that keeps

Cattle gains have increased with the improved condition of the Pilot Rock range.

A seep in a lightly grazed part of the range is turned into a watering place by installing a 50-gallon barrel for a reservoir and piping the water to a trough.

livestock and available forage in balance.

Range in the tract is in great demand among ranchers, evidence of improving condition.

The program has been in effect on the 18,000-acre Cunha Tract of the Pilot Rock Division for 4 years. A recent range utilization check by SCS personnel with Herb Smith, forester-in-charge of Pilot Rock Division land leasing, showed that the degree of grazing is well within safe limits.

The impressive results took time, planning, and money. SCS made inventories of soils and sites to provide basic data on which Georgia-Pacific could formulate a range conservation plan that would coincide with timberland multiple-use plans.

For Uniform Grazing

Thus far in the program 27 miles of fencing has been installed and repaired to complete the boundary and 6 miles of cross fencing to separate seasonal ranges and allow improved grazing distribution. Ten springs have been developed to provide ample stock water for more efficient use of forage.

Stock is kept from the range until grass has good growth and the ground is dried out enough to prevent trampling. Salt is placed in unused areas to encourage more uniform range use.

The Pilot Rock Division has planned experiments to determine whether the program has any effect on reproduction and growth of trees. Consideration also will be given to a workable plan for rotation deferred grazing.

"A conservation program such as this might seem foreign to a company primarily interested in logging and lumber manufacture," said Mr. Smith. "But Georgia-Pacific's progressive thinking, coupled with assistance of the SCS and Southern Umatilla District, has proved such conservation not only possible but successful." ♦

Snow Surveys and Water-Supply Forecasting

Most of the water for the Western States—for agriculture, industries, cities, power—comes from the snow that falls in the mountains.

Several times each winter more than a thousand snow surveyors measure the snowpack on some 1,400 snow-survey courses in remote, rugged mountain areas of the Western States and British Columbia. Data they collect are translated into a water-supply forecast issued by the SCS, usually about mid-April. ♦

Scouts Serve Community, Earn Badges By Helping Install Watershed Project

AS the last of the construction equipment moved out of the Dry Creek Debris Basin near Lehi, Utah, a group of young conservationists moved in.

Boy Scouts from the nearby communities of Highland and American Fork seeded the steep borrow areas and banks of the newly constructed dam with grass and clover. They placed tree limbs and rocks as checks in the recently eroded areas and followed up with tree and shrub planting to provide erosion control and food and shelter for wildlife.

Conservation of natural resources is one subject that all Scouts must have to fulfill their advancement requirements. In providing projects for the boys to work on, the Soil Conservation Service has found a place to use the Scouts in the American Fork-Dry Creek Watershed Project. This not only provides an opportunity for the boys to serve the community, but it also helps reduce costs and speed up construction.

During the annual spring camporee 100 boys and leaders from the Alpine Scouting District reseeded special purpose terraces at the head of Dry Canyon above Lindon. During the winter and spring months ditchbanks were seeded with sod-forming grasses. Browse and shrubs were planted in the foothills to provide soil cover and winter food for the deer and small game animals. Trees were planted on the Battle Creek Debris Basin to provide cover and beautification of the area. Trail and campsite improvement was practiced while on hikes and overnight camps.

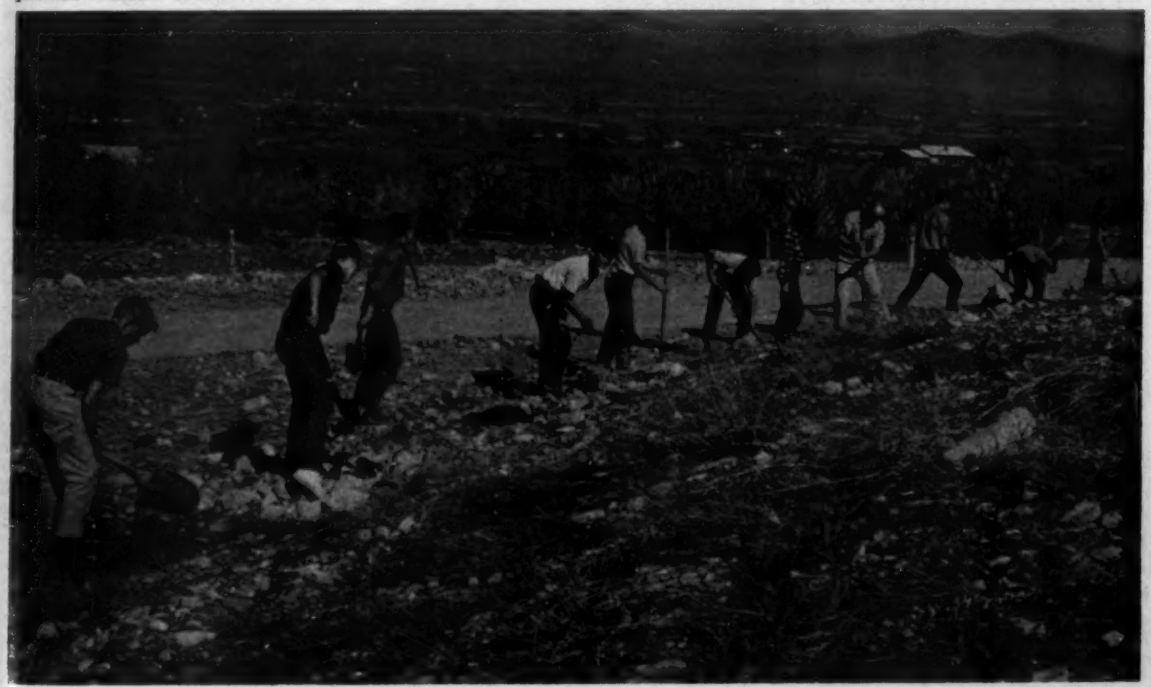
Some 350 boys from American Fork, Alpine, Highland, and Pleasant Grove have put in more than 900 hours of conservation work in the watershed in the past 2 or 3 years.

With the completion of the Grove Creek Debris Basin near Pleasant Grove, arrangements have been made for the Pleasant Grove and Lindon Boy Scouts to seed the steeper areas of the dam.

Scouts from Lehi and American Fork are in the process of seeding irrigation ditchbanks, and more trees will be planted in the spring.

As more problems and projects come up, the Scouts will be contacted and the watershed administrators can be assured that the work will be carried out, for these boys know that conservation done today means a better America tomorrow.—DONALD W. BELL, *Soil Conservationist, SCS, Lehi, Utah.* ♦

A group of Boy Scouts from Pleasant Grove plants trees at the Battle Creek Debris Basin site to control erosion and provide wildlife cover.



Soil Conservation Service and Magazine Mark 30th Anniversary

Nineteen Sixty-Five marks the 30th anniversary of the Soil Conservation Service and *Soil Conservation* magazine.

On April 27, 1935, the Seventy-fourth Congress passed Public Law 46 creating the Soil Conservation Service of USDA. This act for the first time gave national recognition to the menace of soil erosion and brought into one agency the soil conservation work of USDA and the Department of the Interior.

On August 1, 1935, the Bureau of the Budget authorized the publication of *Soil Conservation* as the official organ of the Soil Conservation Service.

Here are some of the events and problems reported in the magazine 30 years ago:

Ninety-four new erosion demonstration projects were announced on August 5, with allocation by the President of $25,500,200 of Works Relief funds. At that time there were already 40 projects in operation.

Nineteen new nurseries were established to meet the pressing demand for trees, shrubs, and grass seed for use in erosion control demonstration projects, bringing the number of nurseries to 83.

Eight of the 11 original regional offices were established throughout the country in 1935.

The employment of relief labor was a major concern of Government agencies in 1935. The magazine reported 18,433 workers transferred from relief rolls to SCS in October.

Some of the topics discussed in the magazine 30 years ago were wind and water erosion, dams, pasture contouring, terracing, erosion-control demonstrations, highway protection, machinery, grass cover, gully erosion, and gully control. The organization of SCS research was played up prominently in early issues of the magazines.

Many of these same problems are still with us, but the techniques for handling them have progressed through the years. The organization of SCS has changed too. The regional offices, demonstration projects, relief labor, and SCS research are gone.

Soil Conservation magazine also has gone through a metamorphosis. It started out as a 16-pager; now it has 24 pages. It has changed its appearance several times, from 2-column to 3-column format, and to more modern type and pictorial style. It has had four editors during the past 30 years: Wellington Brink from 1935-56, Tom Dale 1957-61, and Frank B. Harper 1961-64 preceded the present editor. ♦

Farmland To Recreation and Homes

WINDSOR LAKE, north of Madison, Wis., is the center of a successful transformation of farmland to recreation and residential uses.

With the help of the Soil Conservation Service, Mel Busse, a Dane County farmer, constructed a 10-acre lake around which a subdivision of homes and an 18-hole golf course have been established.

Busse made use of a basic resource on his land—a spring—to form the lake. He used the soil map provided to him as a cooperator with the Dane County Soil Conservation District in locating the land best suited for the golf course and home sites.

A neighboring farmer, Millard Erickson of DeForest, also developed a spring-fed lake on his property. Homes are going up on the lakeshore. Here, too, the SCS soil map helped plan the land use changes. Conservation measures on the land kept in farming will protect the lake from siltation.—HAROLD B. PORTER, *Work Unit Conservationist, SCS, Madison, Wis.* ♦

Crops once grew where this 18-hole golf course is laid out on the shores of Windsor Lake, Wis.

Natural Beauty and Conservation

By Lyndon B. Johnson

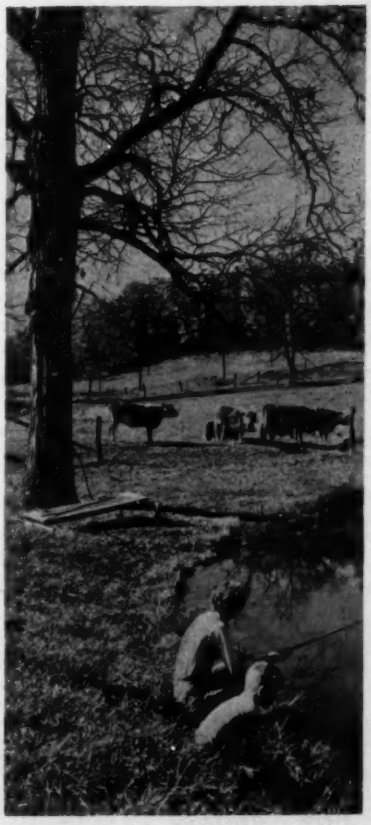
BEAUTY is not an easy thing to measure. It does not show up in the gross national product, in a weekly pay check, or in profit and loss statements. But these things are not ends in themselves. They are a road to satisfaction and pleasure and the good life. Beauty makes its own direct contribution to these final ends. Therefore it is one of the most important components of our true national income, not to be left out simply because statisticians cannot calculate its worth.

And some things we do know. Association with beauty can enlarge man's imagination and revive his spirit. Ugliness can demean the people who live among it. What a citizen sees every day is his America. If it is attractive it adds to the quality of his life. If it is ugly it can degrade his existence.

Beauty has other immediate values. It adds to safety whether removing direct dangers to health or making highways less montonous and dangerous. We also know that those who live in blighted and squalid conditions are more susceptible to anxieties and mental disease.

Ugliness is costly. It can be expensive to clean a soot smeared building, or to build new areas of recreation when the old landscape could have been preserved far more cheaply.

Certainly no one would hazard a national definition of beauty. But we do know that nature is nearly always beautiful. We do, for the most part, know what is ugly. And we can introduce, into all our planning, our programs, our building, and our growth, a conscious and active concern for the values of beauty. If we do this



then we can be successful in preserving a beautiful America.

There is much the Federal Government can do, through a range of specific programs, and as a force for public education. But a beautiful America will require the effort of government at every level, of business, and of private groups. Above all it will require the concern and action of individual citizens, alert to danger, determined to improve the quality of their surroundings, resisting blight, demanding and building beauty for themselves and their children.—*From White House Message to Congress on Natural Beauty, Feb. 8, 1965.* ♦

By Orville L. Freeman

ALTOGETHER the farmers and ranchers in this country control the use of soil, water, forests, and wildlife on 85 percent of our land area—and the Department works directly with them in programs to conserve, manage, and develop the use of these resources. In addition, there are some 180 million acres of National Forest and Grasslands which are administered for public use by the Department. Within the Department, vast programs of conservation research, education, technical and financial assistance, and management are functioning to protect and conserve the bulk of the Nation's soil, water, and timber resources . . . .

The work that is being done in every State provides the basis for a whole new concept of what rural America is and can be. This emerging concept is the basis for the better life that President Johnson so eloquently challenges us to reach out for in building a Great Society. In a vital and critical sense, this means the work of conservation—of making full use of the great outdoors to accomplish a more meaningful life for all our people.

No longer is it necessary for the factory, shop, or market, by the need for power, to be tied to the river waterfall, or by the need for communication and transport to be tied to the harbor or railroad. Rural electrification, rural telephone systems, and better highways and truck transport have changed that. Now it is economically feasible for America's people to both live and play where they seem to prefer—in the countryside—and to work where they want to live.

President Johnson, in describing his vision of the Great Society,

said that we must begin to build it in the city, in the countryside, and in the classroom. Through wise use—through the application of new dimensions of conservation—we can make the countryside a classroom for the people of the city to study and enjoy the great outdoors.

And, if we are successful builders and good teachers, we may create an environment where the simple truths of nature and the green beauty of open space enables us to match the meaning of our lives with the marvelous products of our labor.—*From address to Minnesota Conservation Federation, Sept. 19, 1964.*

Planning Our Town. By Martha E. Munzer. *1964. Alfred A. Knopf, New York. 180 pp., illus. $3.95.*

This book was prepared for the Conservation Foundation as an introduction to city and regional planning for young readers. It should be equally valuable to adults interested in understanding the complexities of planning.

The author uses her own home town near New York City as an example to illustrate the problems of city planning as encountered, first, in planning a new town, then in rebuilding an old one. From there she moves to the larger horizon of resource planning in relation to the total living environment, including considerations of the use, development, and conservation of water, air, living space, recreation, and transportation. These are skillfully tied into the needs back in "our town."

The book is well illustrated and includes a selected reading list and list of institutions offering studies and degrees in planning professions. The latter should be helpful to young readers considering careers in regional or city planning.

The author is a graduate of Massachusetts Institute of Technology and taught chemistry in New York high schools before her association with the Conservation Foundation. A broad understanding of resource interrelationships is evidenced in this contribution to planning.—John W. Barnard, *Resource Development Division, SCS.*

Handbook of Applied Hydrology. Edited by Ven Te Chow. *1964. McGraw-Hill Book Co., New York (1,415 pp.) illus. $39.50.*

The large body of hydrologic information and technology originated and used by the Soil Conservation Service finds its way into the technical literature available to the general practitioner by means of chapters contributed by SCS authors and former colleagues to this "compendium of water-resources technology" (subtitle).

The book consists of 29 sections by 45 authors. Pages and figures in each section are numbered in a separate series.

Two sections were written by people actively engaged in hydrology and watershed work in the Soil Conservation Service:

Sec. 17-I. "Reservoir Sedimentation," by Louis C. Gottschalk, geologist (recently retired.)

Sec. 21. "Hydrology of Agricultural Lands," by Harold O. Ogrosky, chief, Hydrology Branch, and Victor Mockus, hydraulic engineer.

Another section is the product of former SCS employees:

Sec. 12. "Infiltration," by G. W. Musgrave, retired and now a consultant in hydrology, and H. N. Holtan, hydraulic engineer, Agricultural Research Service.

In addition, technical information from the Soil Conservation Service is widely used in other sections, and publications of SCS people are cited in the references. This book incorporates some of the methodology of SCS into an organized body of information on applied hydrology.—B.O.

New Publications

Sedimentation of Loch Raven and Prettyboy Reservoirs, Baltimore County, Md. By John N. Holeman. *1965. USDA SCS TP-145. 18 pp., illus.*

A well-illustrated report based on 1943 and 1961 sedimentation surveys showed that sedimentation rates in the two watersheds decreased appreciably between these dates. The principal reasons appeared to be the conversion of large acreages from agricultural to residential and other nonfarm uses and the installation of conservation measures on much of the remaining farmland. Data from both surveys indicate a decreased rate of sediment accumulation during the 1943-61 period from that in the earlier period.

The annual rate of sediment accumulation per square mile of drainage area in Loch Raven Reservoir before 1943 was 0.618 acre-foot, for 1943-61, 0.187 acre-foot. For 1933-43 the rate of sediment accumulation in Prettyboy Reservoir was 0.699 acre-foot per square mile of drainage per year; for 1943-61, 0.391 acre-foot.

The report also describes the geology and soils and the conservation measures and land use of the area.—G.A.K.

An Engineering Career for You in the Soil Conservation Service. *Rev. 1965. USDA Misc. Pub. 715. 2-page fold, illus.* A description of job opportunities in the fields of structural design, hydrology, hydraulics, construction irrigation, drainage, erosion control and water conservation, geology, soil mechanics, and water-supply forecasting.

Poverty in Rural Areas of the United States. By Alan R. Bird. *1964. USDA Agr. Econ. Rpt. 63. 46 pp.* Basic statistics for those concerned with the war on poverty.

Skiing. By U. S. Forest Service. *1964. USDA PA-525. 16 pp.* Notes on winter playgrounds in the National forests.

From the Administrator:

Land Treatment • What Districts Do

WHAT IS a small watershed project? How can the average citizen, traveling across this broad land, know when he sees one?

A completed small watershed project is a combination of all the needed conservation measures applied to all the land draining into a small stream (a watershed), supported by necessary structures to regulate runoff so as to avoid destructive floods and turn the water to planned beneficial uses.

Such a watershed project plan translated from specifications on paper to realities on the land should be obvious to any passerby. Most conspicuous will be the presence of appropriate vegetation on every acre, each used in keeping with its capability—well-tended crops, lush grass, trees, and wildlife cover; the presence everywhere of needed conservation practices—terraces, strip crops, ponds, and the like; and the absence of scars of erosion and deposits of sediment.

The dams, floodways, diversions, and other structures that commonly receive most attention in the discussion of project plans may be out of sight of highways or inconspicuous in the landscape. Although they involve the major expenditure of public funds and are the physical core of a successful project, structures alone do not make the project.

Land treatment comes first. It is the basic element of watershed protection. Not only is it needed on every acre to protect soil, water, plant, and animal resources in place, but it is necessary for the successful operation and long life of the water-regulating structures in the valley.

Collectively, land treatment measures are the most evident features of an effective watershed project. They should proclaim clearly to the traveler that he has entered a treated watershed.

Unfortunately, too many of the watershed projects now considered as "completed" fall short of being such a showcase of sound land use and treatment. Under present standards, the minimum requirement is basic conservation plans on 50 percent of the land draining to a site before the structure is built.

It should be emphasized that this is a *minimum*. Our objective should be at least 75 percent of needed measures applied on an entire watershed within 5 to 10 years in most projects. The long-term goal is conservation treatment on 100 percent of the area. Only then is a watershed project *complete*.

Such projects not only will accomplish the local objectives of flood prevention and coordinated resource use but they will meet the modern conservation challenge of preserving and enhancing the natural beauty of the American landscape.

WHAT DISTRICTS do for America: I had occasion to summarize for soil and water conservation district officials attending the annual meeting of their national association (NACD) recently what districts do for America.

All America needs to know about the vital role of these local citizens' bodies in the life of our Nation. At this crucial time in the evolution of the conservation movement, urban people have a special interest in what districts do to preserve and improve our natural resources and sustain our economy. Here is my list:

- Soil and water conservation district programs create new wealth in rural and urban America.
- They reduce waste and damage in the use of soil, water, and related natural resources.
- They strengthen the economic capability of rural America, and thus contribute to the health of the total national economy.
- They reduce the flood hazards and the silting of rivers, harbors, and reservoirs.
- They create additional private employment opportunities.
- They develop a wider usefulness for all of America's natural resources.
- They create a strong market for the products of industry.
- They develop new and improved water supplies for industry, agriculture, recreation, and municipalities.
- They add to the fish, game, and wildlife population.
- They promote privately owned recreational space and facilities.
- They provide an organized channel for the practical application of research and science to current resource problems.
- They encourage the improved management and marketing of farm-produced timber and wood products.
- They contribute substantially to the beauty of the countryside.

And, for the benefit of those concerned with watershed treatment and water management, I might add—

- They co-sponsor nearly all the small watershed projects in the country.

—D. A. WILLIAMS

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Multipurpose Reservoir and Land Treatment

Story on page 199.

This multipurpose reservoir and the conservation land treatment around it go hand in hand to provide flood prevention, community water supply, economic development, recreation areas, and a more beautiful countryside. The structure (l., r.) is on East Wards Fork, Roanoke Creek Watershed, Va. ♦